# Section of the History of Medicine

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## René Descartes, 1596—1650
## A Short Note on His Part in the History of Medicine

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IT can be ascertained that, in 1628, Descartes became particularly interested in attempting to solve by mathematical methods the problems of biology and medicine and to confirm the answer by anatomical observations and experimental methods; this study he continued till his death in 1650. That he failed in his task is due to the scanty fundamental information and data available at the time; those who followed him, like Borelli and also Baglivi, were unable to perpetuate iatro-physics, because medicine, as it was then understood, did not lend itself to mathematical investigation. It was only later, as in the last century, when instrumentation, together with biological knowledge, became an integral part of medical practice, that suitable observations were subject to mathematical proof. Thus the role played by Descartes in medical progress was more symptomatic than significant.

It might be said, with more assertive brevity than factual accuracy, that as Galileo was the father of modern astronomy, so Bacon inspired science, Harvey heralded the advent of contemporary medicine, and Descartes made the new philosophy. Such a list could be extended, but reflection will suggest that these names simply represent phases in a continuous process and that, however great the contribution to general progress of these eminent scientists, they had to rely on the knowledge of their predecessors. Admittedly, Descartes intended to make a clean sweep of all preconceived ideas—but did he, in reality? Even when adopting the opinions of Harvey in relation to the circulation of the blood, was not the French thinker fettered by the views of Galen in connexion with the action of the heart?

The tercentenary of his death is an occasion for explaining how it came about that Descartes, who was an eminent philosopher and clever mathematician, notwithstanding many efforts, did not succeed in making a single lasting discovery in medicine; nor did he recognize at their full value those that were being made in his time. A simple and homely comparison may help to explain. In geometry a straight line is the shortest between any two points—but the same axiom does not apply in all biological problems, for their solution is often obtained by the indirect approach. For example, the microscopical classification of Foraminifera, which provided most valuable indications in relation to oil-borings, or perhaps, better still, the experiments of Francesco Redi (1626–98) on the "spontaneous" generation of flies, which resulted in advancing the knowledge of bacteriology.

Such considerations may be kept in mind, when recalling the tercentenary of the death, on February 11, 1650, of René Descartes, even if opinions differ as to his significance in furthering medical progress. Thus Singer (1928) writes, p. 127: "A strong point in his theory is the great stress laid upon the nervous system and its power of co-ordinating the different bodily activities. Thus stated, his view is not far from the modern standpoint, though in fact he was grotesquely wrong in detail." In the *Bibliotheca Osleriana* (1929) Osler wrote, p. 76: "He (Descartes) was the first foreigner of distinction (though really, at the time, he was not known as an author) to accept Harvey's views." It can be recalled that Descartes also wrote on embryogeny and Needham (1934), p. 135, after quoting R. Garden (1693) as having said that in applying the laws of motion to the forming of an animal "how wretchedly Descartes came off", goes on: "In doing so he was many years before his time." Guthrie (1945), p. 176: "The effect of 'Cartesian' philosophy on medical science was considerable." In Castiglioni (1947) the subject is discussed at length and on p. 507 it is stated: "There is an essential connexion between the philosophy of Bruno (Giordano Bruno 1548–1600) and that of René Descartes (Cartesius), whose name has great importance for the history of medicine, not only on account of his personal contributions as physiologist and pathologist but also on account of the effect that Cartesian philosophy exerted on the evolution of medicine."

On the other hand, Creutz-Steudel (1948) do not mention Descartes or Borelli and only refer to Giorgio Baglivi (1668–1707)—the last of the iatro-physicists—in an indirect manner.

Lastly, Jefferson (1949) writes, p. 692: "It is evident from Descartes' letters, as well as from his writings, that he was deeply intrigued by medicine."

To obtain some clarity from these discordant opinions it is necessary to refer briefly to some details of the life of Descartes, hitherto overlooked and essential to any consideration of his relationship to medicine.

It is from 1626—the year of Francis Bacon's death, the news of which greatly affected Descartes—that the significant incidents can be observed. He had returned to Paris that year and there met the friend of his childhood days Marin Mersenne (1588–1648) and Claude Mydorge (1585–1647), a skilled mathematician—who revived the interest which Descartes had shown in geometry both as a schoolboy and young officer in the army—for up till then there was no hint that he intended applying mathematics to any but commonly accepted uses.

In 1628 an incident occurred which altered the outlook of Descartes, and was profoundly significant for his future activities. The Papal Nuncio, Cardinal de Bagni, held an assembly to hear a most eloquent Dr. Chandoux (who in 1631 died on the scaffold as a false coiner) propound a new system of philosophy; Descartes attended with Mersenne and Dr. de Ville Bresseux of Grénoble. Having been pressed by Cardinal Pierre de Bérulle (1575–1629) to take part in the discussion, Descartes showed that by arguments it was possible to prove the true to be false and the false to be true. Asked how these evils of sophistry could be avoided he answered that there was no truth that could not be demonstrated by mathematics. A few days later, Descartes visited Cardinal de Bérulle and explained how mathematical proof could be applied not only to mechanics, but also to medicine. The Cardinal thereupon impressed Descartes with the seriousness and importance of such a task—remarks which made a deep impression on the young philosopher; indeed, such was the effect on the mind of Descartes, that in March 1629 he departed for Amsterdam, for he held that only in Holland could he meditate in freedom and quiet. It is recorded that he was entered as a student in the newly formed University at Franeker on April 16, 1629, as: *Renatus Descartes, Gallus philosophus.* He returned to Amsterdam, where chemistry and anatomy occupied his attention. Baillet (1691), Vol. I, p. 196, mentioned that in Amsterdam Descartes visited the butchers' shops daily, taking home specimens for more careful dissection. It seems therefore all the more remarkable that he did not notice that nerves were solid and not tubes carrying the nervous fluid. Descartes then matriculated in the University of Leyden on June 27, 1630.

In 1640–42 Descartes made the acquaintance of Elisabeth, Princess Palatine (1618–80)—the daughter of the "Queen of Hearts"—with whom he corresponded in truly courtly style. In 1647 he began an exchange of letters with Christine of Sweden (1626–89) to whom he addressed a dissertation, discussing which could be more harmful, unreasonable love or unjustified hatred. The Queen summoned Descartes to Stockholm; he arrived in Sweden early in October 1649. He was soon received in audience by the Queen and Descartes, who since his youth had kept in bed till midday, had to become an early riser. The cold climate did not suit him, an old lung ailment (tuberculosis ?) flared up again and on February 11, 1650, after a short illness, Descartes died of inflammation of the lungs.

Such is a note of the relevant part of the life of Descartes; for our purpose the essential feature is that in 1628—in Paris—he became persuaded that the problems of biology and medicine were susceptible of mathematical proof. Once this start had been made, there is frequent proof of his keen interest in medical matters. In January 1630 he wrote to Mersenne —who was suffering from erysipelas—that he should preserve his health till he—Descartes—had discovered a system of medicine capable of irrefutable demonstration. Even so, he also wrote to Mersenne (Baillet, Vol. I, p. 197) that after eleven years of study there was no portion of the body he could not explain, but as yet he could not cure even a fever—an ailment he considered peculiar to man.

In the *Méthode* (1637), p. 62, he wrote: "There were endless possibilities before men of freeing themselves from maladies of body and mind, as well as from the debility of old age." Numerous other quotations could be made from the writings of Descartes to show his eager desire to apply geometry to the solution of medical problems; one instance among many is the posthumously published: L'homme et un traité de la formation du fœtus du mesme autheur (Paris, 1664). Of this work, Needham (1934), p. 135, says: "Descartes, in fact, with premature simplification, was trying to erect an embryology *more geometrico demonstrata.*"

That Descartes promptly accepted the Harveian circulation of the blood can be mentioned, but what is particularly remarkable is that he did so in saying that Harvey had shown a communication between the arteries and veins by means of little tubes. This unfortunately was not a correct quotation, for Harvey not only had not seen the capillary connexion between arteries and veins, but did not believe it existed. Instead he thought that the blood oozing out of the finest arterioles was sucked up again by the endings of the veins—one

can assume somewhat in the manner a rivulet ends in sand and then re-forms itself lower down. In relation to the action of the heart Harvey and Descartes did not agree—for the latter said that when the heart contracted, it was preparing to expand and suck up the blood—according to Galenical doctrine.

Adrien Baillet—the biographer of Descartes, Vol. II, p. 543, discussed whether he discovered the circulation of the blood and concluded that he could have, had he not been forestalled by Harvey!

It is unfortunate that Descartes is more often remembered for the mistaken opinions he expressed than for the useful principles he propounded—for example that the pineal gland contained the soul of man—leaving out of consideration that animals, which had no soul, also possessed a pineal gland. To solve the difficulties of medicine by accurate methods was not a preposterous suggestion—it was only premature, for the necessary factual information was lacking. It was Giovanni Alfonso Borelli (1608–71) who made the only possible adaptation at the time—viz. the mechanical explanation of certain muscular movements, so that even to-day the same principles find application. It is with reason that Singer (1928), p. 129, can write that the achievement of Borelli was more lasting than that of Descartes.

Before concluding it may be mentioned that it has been often suggested that Descartes was influenced by the writings of Francis Bacon (1561–1626) who was greatly admired by the French philosopher. Reference is usually made to both when it is a question of describing the progress of the experimental method. There is, however, an essential difference between the aim of Bacon and of Descartes in the use of experiment; Bacon considered it a means of obtaining information about new laws and providing arguments for the discovery of new technical achievements. Descartes instead viewed experiments as the means for confirming doctrines due to mathematical reasoning. It can be assumed that he was impressed by Harvey's calculation of the output of the heart.

Therefore, though it is a misuse of words to say that Descartes contributed personally to physiological or even to pathological knowledge, yet it can be reasonably suggested that, by his advocacy of experiment as a confirmation of theory, by his attempt to make biological laws and medical observations amenable to mathematical proof (one cannot help recalling the doctrines of Alkindi (*c.* 873) of Bagdad in relation to posology), by his inspiration of iatro-physics—possibly a sterile, but not a retrograde system of medicine and, by no means least, by his efforts to combine physiology with psychology in relation to reflexes—Descartes deserves to be honourably remembered in the history of medicine.

Apart from the books mentioned in the text, great help has been obtained from: Elizabeth S. Haldane—*Descartes—His Life and Times* (London, 1905), Murray. A work I would gladly have read, but could not obtain, is: B. de Saint Germain—*Descartes considéré comme Physiologiste et comme Médecin* (Paris, 1870).

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## The History of Diverticulitis of the Intestine

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IN what may be termed the natural history period of medicine there are descriptions of abnormalities of the intestinal tract varying from monstrosities to those compatible with life. These were summarized by Voigtel as late as 1804 and Fleischmann in 1815 without a very clear differentiation. The eighteenth century appears to have been an *epoch of doubt*, doubt about the significance of these anomalies and doubt about their causation. Leaving aside the monstrosities, the other forms were usually held to be the result of traction, especially in association with the entrance of portions of the intestine into hernial sacs. Littré (1700) believed that a diverticulum may be formed when part only of the wall of the intestine enters the hernial sac and not the whole diameter, so that only one side of the intestine is pulled out and finally becomes a longer and longer canal. Morgagni (1761), in discussing hernia, accepts this explanation in general for those diverticula, later to be differentiated by